

TAXONOMIC REVIEWS OF *LIOON* CASEY AND *LITEMUS* CASEY,
WITH DESCRIPTIONS OF TWO NEW SPECIES
(COLEOPTERA: BYRRHIDAE)

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Abstract.—The genera *Lioon* Casey and *Listemus* Casey are redescribed; *Lioon nezperce*, new species, and *Listemus kootenai*, new species, are described. The following new synonyms are presented: *Lioon simplicipes* (Mannerheim) is the senior synonym of *L. speculare* Casey and *L. puncticeps* Casey, and *Listemus acuminatus* (Mannerheim) is the senior synonym of *L. satelles* Casey and *L. formosus* Casey. Lectotypes are designated for *Lioon puncticeps* Casey, *L. speculare* Casey, *Listemus acuminatus* (Mannerheim), and *L. formosus* Casey.

Key Words: Coleoptera, Byrrhidae, taxonomy, nearctic

Continuing studies by me on the Byrrhidae have led to the discovery of undescribed species of *Lioon* Casey and *Listemus* Casey from northern Idaho and northeastern Washington states, U.S.A. Additionally, several synonymies are updated and four lectotypes are designated. Thus, this report is intended to briefly review the species of *Lioon* and *Listemus*, and to describe one new species in each genus.

GENUS *LIOON* CASEY 1912

Type species: *Amphicyrta simplicipes* Mannerheim 1852: 342, here designated.

Lioon was established by Casey (1912) to include *Amphicyrta simplicipes* Mannerheim (1852), *Simplocaria inflata* LeConte (1868), and his own species *L. speculare* (Casey 1912) and *L. puncticeps* (Casey 1912). Curiously, Casey failed to note a type species for *Lioon* even though he did so for other genera newly described in the same article. Types or type series have been examined for all described taxa except *A. sim-*

plicipes, for which the type could not be located (H. Silfverberg, in litt.).

Casey's (1912) original description of *Lioon* is detailed, but critical characters for an adequate contemporary comparison with other genera were not included. Thus, with the discovery of a new species attributable to this genus the following generic redescription is presented:

Form small, length 2.5–4.2 mm, ovoid-globose, highly convex dorsally; shallowly to deeply depressed at pronotal-elytral juncture; integument shining, piceous with olivaceous reflections to subviridescent, venter without viridescent reflections; evanescently microreticulate; shallowly punctate, each puncture bearing a single pale seta.

Head not reposable, mouthparts always visible. Eye ovoid, narrowing anteriorly, facets individually convex. Antenna 11-segmented, clavate; segment 1 short, fusiform; segment 2 short, narrowing distally; segment 3 long, slender, cylindrical; segments 4–5 short, cylindrical; segments 6–11 pro-

gressively widening and compressed. Frontoclypeal margin carinate; clypeus obsolescent, shortest medially, lateral angles minutely triangular; anteclypeal region coriaceous. Labrum quadrate, emarginate anteriorly. Mandibles asymmetrical in molar region, rightside mandible shallowly excavated and with a stout premolar tooth, left-side mandible deeply excavated but without premolar tooth; ectal surface evenly rounded laterally with a broad flange extending dorsally; dorsum flattened with a short anterior tubercle; carinate on ventral margin. Maxillary palpus 4-segmented, ultimate segment pyriform, attenuate; lacinia and galea lobate, densely setose apically; lacinia reduced, $0.5 \times$ length of galea. Labium lightly sclerotized, ligula membranous, shallowly emarginate and densely setose anteriorly; palpus 2-segmented, ultimate segment pyriform. Posterior tentorial pits shallow.

Pronotum trapezoidal, narrowing anteriorly, strongly convex, anterior angles not visible from dorsal aspect; posterior margin with 4–8 peg-like crenulae set slightly below margin of dorsal surface; hypopleura triangular, broad and shallowly concave posteriorly; prosternal sutures deeply sulcate. Prosternum with disc T-shaped, transverse arms broad; median process broadly rounded apically. Mesosternum obsolete laterally, deeply excavate medially for reception of prosternal process. Scutellum small, triangular, acuminate posteriorly. Elytra connate, without ventral preapical flange; epipleura broad basally, narrowing apically and terminating shortly before apex. Metanotum apterous; axillary sclerites obsolete. Metasternum quadrate, $3.5 \times$ wider than long, anterior intercoxal process wide; metendosternite obsolete; metepisternum and metepimeron obsolete. Legs not retractile; procoxae and mesocoxae globular; metacoxae narrow, transverse; trochanters short, triangular; femora fusiform; tibiae slender, apex briefly excavate to receive tarsomere 1; tarsi 5-segmented, filiform, simple; pre-

tarsus with simple paired claws, each with 2 empodial setae.

Abdomen slightly longer than broad, proportionately shorter and broader in male; sutures linear, suture 1 obsolescent, sternites 1 and 2 connate; intercoxal process of sternite 1 broad, width greater than length of a metacoxa; visible sternite 5 broadly rounded apically. Aedeagus trilobed, median lobe with apex subangular, lateral lobes elongate, basal piece incompletely sclerotized, dorsal sclerotization reduced with disc membranous. Female gonocoxite lobate, compressed, moderately setose; stylus short and cylindrical to conical, with 2 long apical setae.

Lioon simplicipes (Mannerheim)

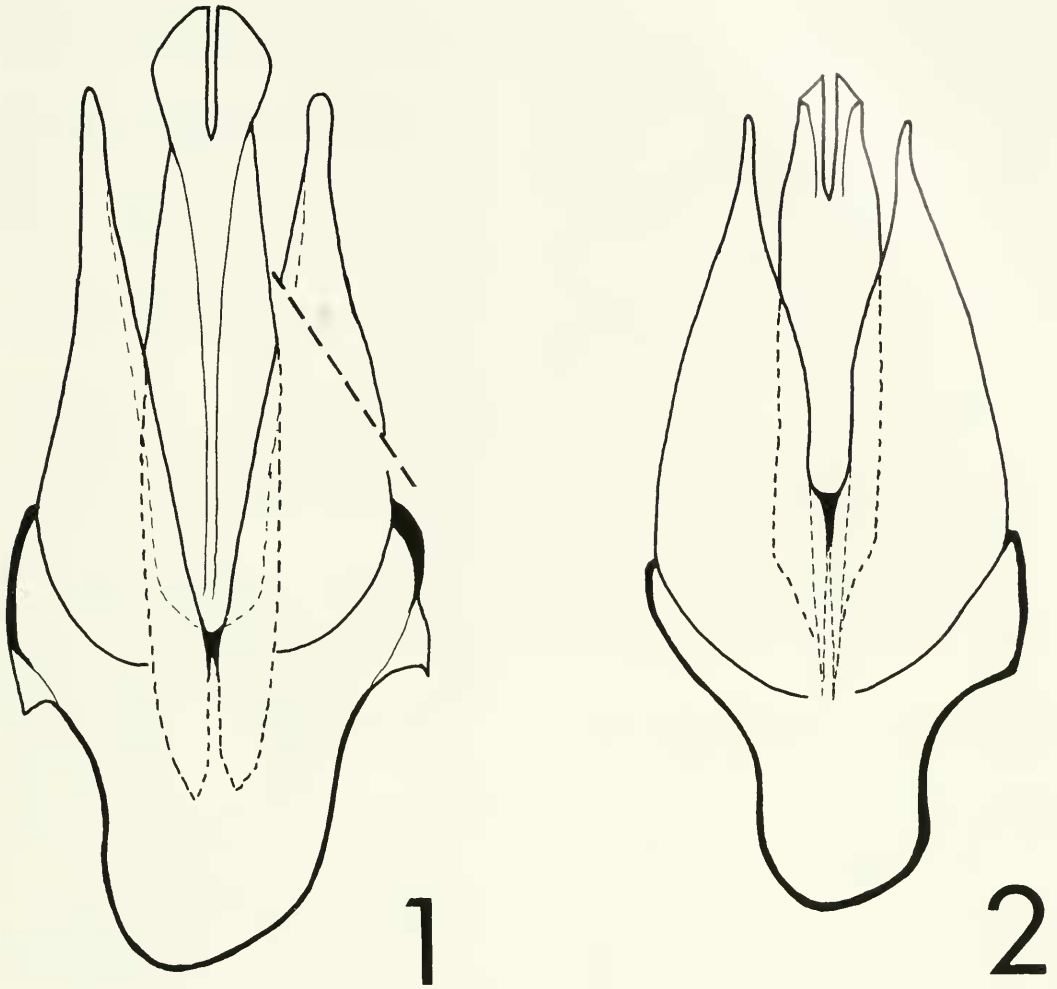
Amphicyrta simplicipes Mannerheim 1852: 342; LeConte 1854: 116; Hamilton 1894: 27; Dalla Torre 1911: 18. Type: not seen, apparently lost (Silfverberg, in litt.). Original repository: Zoological Museum, Helsinki. Type locality: "insula Sitkha," Alaska.

Simplocaria inflata LeConte 1868: 62; synonymy by Henshaw 1882: 230; Dalla Torre 1911: 13; Leng 1920: 193. Holotype: sex not confirmed, probably female. Labelling: "Cala.; Type 8150; S. simplicipes (Mann.), inflata LEC." Repository: Museum of Comparative Zoology, Cambridge. Type locality: California.

Lioon simplicipes (Mannerheim), of Casey 1912: 69; Leng 1920: 193; Hatch 1961: 301.

Lioon inflatum (LeConte), of Casey 1912: 69.

Lioon speculare Casey 1912: 68; Leng 1920: 193; Hatch 1961: 302. **NEW SYNONYM.** Lectotype here designated: sex not confirmed, probably female. Labelling: "Metlakatla, B. Col., Keen; Casey bequest 1925; Type USNM 48388; speculare Csy." Repository: U.S. National Museum of Natural History. Type lo-



Figs. 1-2. Aedeagi of *Lioon* spp., dorsal aspect; Fig. 1, *L. simplicipes* (Mann.), right paramere detached to show variation; Fig. 2, *L. nezperce*, n. sp.

cality: Metlakatla, British Columbia. Paralectotype with same data.

Lioon puncticeps Casey 1912: 69; Leng 1920: 193; Hatch 1961: 302. NEW SYNONYM.

Lectotype here designated: sex not confirmed, probably female. Labelling: "Cal; Casey bequest 1925; Type USNM 48389; puncticeps Csy." Repository: U.S. National Museum of Natural History. Type locality: Arcata, Humboldt Co., California. Three paralectotypes with same data.

Mannerheim (1852) evidently had at least two specimens before him at the time of description; the locations or existence of these specimens are at present unknown (Silfverberg, in litt.). The type locality was originally given as "insula Sitkha." This locality is presumed to be what is now Baranof Island in the Alexander Archipelago, on which is sited the previous settlement and now town of Sitka, Alaska.

LeConte (1868) stated that *Simplocaria*

inflata “. . . is easily known by its very inflated form, resembling in outline *Amphicyrta simplicipes*,” and briefly noted some characters of punctuation and form. Later, apparently through advice to Henshaw (1882), LeConte provided the synonymy of *S. inflata* and *A. simplicipes*. Although Dalla Torre (1911) listed these species separately as *S. inflata* and *A. simplicipes*, they were reassociated generically by Casey (1912). Casey recognized *S. inflata*, but without discussion, and included both species in his new genus *Lioon*.

Both LeConte and Casey based their recognition of these taxa on traits of coloration and punctuation which can be observed to vary considerably within any series of specimens. All specimens in the type series of *L. specularis* are teneral; thus the pallid coloration that primarily defines this species in Casey's key is not valid for species recognition. Genitalic characteristics of specimens fitting the descriptions and tentatively attributable to any of the synonyms are not significantly different between population samples.

Lioon nezperce, NEW SPECIES

Characters as for the genus, except: length 2.5–3.5 mm, width 1.8–2.4 mm, subglobose, oval in dorsal aspect, highly convex in lateral aspect, pronotal-elytral juncture shallowly depressed; piceous with olivaceous reflection, shining, without metallic sheen, piceous ventrally, appendages rufopiceous; punctures small, shallow, equidistant, setigerous. Pubescence pallid, short to moderately long.

Head with punctures moderately sparse, separated by greater than own diameter; anterior margin of frons narrowly carinate; antenna with segment 3 one-third length of segment 2; labrum transverse, short, shallowly emarginate.

Pronotum with lateral margins finely carinate, shallowly reflexed; posterior margin bearing 4 tuberculate crenulae each side of median line. Scutellum slightly longer than

wide, smooth, impunctate, asetose. Elytra with lateral margins carinate, shallowly reflexed.

Aedeagus (Fig. 2) with median lobe flattened, truncate, and laterally expanded at apex; lateral lobes with apices narrowly rounded; basal piece contorted. Female gonocoxites short, broad, lightly sclerotized; styli short, cone-shaped.

This species is known only from the state of Idaho, U.S.A., in the counties of Clearwater, Latah, and Shoshone.

The specific epithet is presented as a noun in apposition, and is in recognition of the Nez Perce, an aboriginal American tribe inhabiting the region in which specimens were collected.

Holotype deposited on permanent loan to the California Academy of Science, San Francisco, through the University of Idaho, Moscow, and bearing the labelling: ID[AHO], Clearwater Co., Aquarius, 1700 ft., T40N R7E s5 NW¼, 5 April 1986; P. J. Johnson collector; in epixylic mosses; Holotype: *Lioon nezperce* Johnson 1990. Additionally, 4 paratypes bearing the same data will be donated to the California Academy of Sciences. Seventeen additional paratypes bearing the same data will be distributed among the W. F. Barr Entomology Museum, University of Idaho; U.S. National Museum of Natural History, Washington, D.C.; The Natural History Museum, London; and my personal collection.

Additional material examined with the following collecting data: IDAHO, Clearwater Co., Isabella Creek, 31.X.1984 (4), 5.V.1985 (26), 14.VI.1985, P. J. Johnson; Beaver Creek, 23.X.1984, P. J. Johnson (3); Idaho Co., 10 mi. E Slate Creek, 28.IV.1983, F. W. Merickel (2), 10.IX.1984, P. J. Johnson (8), 1.VII.1984, A. Allen (35); 20 mi. ESE Lowell, Meadow Creek, 17.V.1983, F. W. Merickel (3), 1.IX.1984, P. J. Johnson (5); DeVoto Memorial Cedar Grove, 1.X.1982, F. W. Merickel (1); Grangeville, 27.V.1985, A. Allen (14); 7 mi. NE Lowell, 27.IV.1985, P. J. Johnson (17); Latah Co.,

7.2 mi. N Harvard, 11.XI.1984, P. J. Johnson (1). Specimens from these additional locations are currently located in collections of the W. F. Barr Entomological Collection, University of Idaho; A. Allen, Boise; or my own.

KEY TO *LIOON* SPECIES

1. Larger, 3.2–4.2 mm; aedeagus as in Fig. 1; distribution as in Fig. 5 *L. simplicipes*
- Smaller, 2.5–3.5 mm; aedeagus as in Fig. 2; known only from north-central Idaho
..... *L. nezperce*

Determination of *Lioon* species is difficult without reliance upon aedeagal morphology (Figs. 1, 2) and distribution (Fig. 5). *Lioon simplicipes* is found only in mesic conifer forests west of the Cascade Range in Oregon and Washington, and coastal forests of the Coast Range mountains in northern California, British Columbia, and southeastern Alaska. Contrarily, *L. nezperce* is only known from mesic conifer forests in north-central Idaho. Its distribution east of the Cascade Range is quite disjunct from that of *L. simplicipes* due to habitat separation by the arid intervening regions.

GENUS *LISTEMUS* CASEY 1912

Type species: Listemus formosus Casey 1912: 6, by original designation.

Listemus was established by Casey (1912) to include *Morychus acuminatus* Mannerheim (1852), and his own new species *L. satelles* and *L. formosus*. Type specimens have been examined for both Casey species, but Mannerheim's type could not be located (Silfverberg, in litt.); however, an apparent cotype in the LeConte collection was examined.

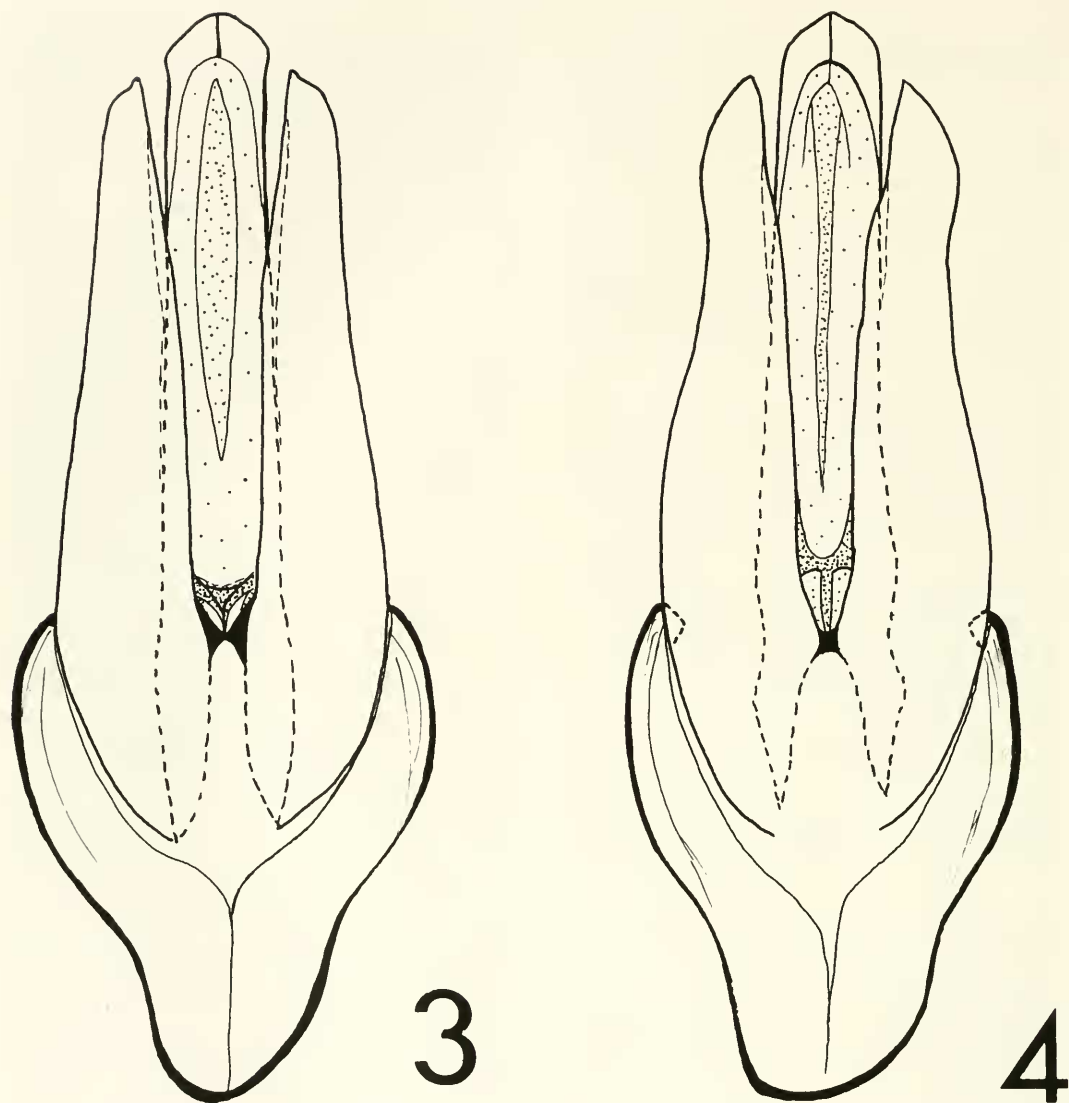
Casey's description of *Listemus* is inadequate for proper comparison with other byrrhid genera, thus with the discovery of a new species the following redescription is presented:

Form small, length 3.3–4.4 mm, moderately convex dorsally, ovoid to elongate-oval in dorsal aspect; pronotal-elytral junc-

ture evenly contoured, not depressed. Dorsal integument piceous, shining, usually with aeneous and viridescent vittate reflections on elytra. Pubescence moderately long, cinereous with rufous to rufotestaceous patches. Punctuation moderate to coarse, sparse to dense, often with rugose areas on elytra especially in the humeral region. Ventral integument rufous to piceous, shining; coarsely, moderately to densely punctate.

Head partially retractile, mandibles visible when head reposed. Eye oval, moderately convex, shallowly emarginate dorso-anteriorly; facets confluent. Antennae 11-segmented, clavate; segment 1 asymmetrically swollen; segment 2 transverse, $0.35 \times$ length of segment 1; segment 3 subcylindrical, slightly expanded distally, $2 \times$ length of segment 2; segments 3 and 4 short, cylindrical, progressively widening distally. Fronto-clypeal margin rounded; clypeus obsolescent, narrow medially, triangular laterally; densely, coarsely punctate. Labrum quadrate; densely, coarsely punctate; shallowly emarginate on anterior margin. Mandibles tridentate at apex, asymmetrical proximally; with setose prostheca; rightside mandible with venter sloping to sharp, linear incisor blade, premolar tooth small, blunt; mola shallowly concave; leftside mandible concave ventrally, incisor blade broadly emarginate; premolar tooth distinct, blunt; mola with oval, shallowly depressed grinding surface. Labium moderately to darkly sclerotized; palpus 4-segmented, ultimate segment narrowly pyriform; galea and lacinia broadly lobate, densely setose apically; submentum rectangular, $2 \times$ wider than long, coarsely punctate, laterally with deep sutural pits; mentum transverse, $3 \times$ wider than long, moderately punctate; prementum trapezoidal, narrowing distally, sparsely punctate; palpus 3-segmented, ultimate segment broadly pyriform; ligula bilobate, densely setose distally.

Thorax with pronotum transversely trapezoidal, moderately convex; hypopleura



Figs. 3-4. Aedeagi of *Listemus* spp., ventral aspect; Fig. 3, *L. kootenai*, n. sp.; Fig. 4, *L. acuminatus* (Mann.).

broad and shallowly concave posteriorly, narrowing anteriorly; prosternal sutures closed. Prosternum T-shaped, lateral arms narrow, medial process wide, broadly rounded apically. Mesosternum obsolete laterally, deeply excavated medially for reception of prosternal process; coxae rounded. Metasternum transverse, $2.5\times$ wider than long; anterolaterally excavated as crural depressions for mesolegs; coxae nearly

approximate, broad medially, sinuate at midlength, gradually narrowing laterally; excavate posteriorly for reception of femora; posterior intercoxal process narrow. Scutellum small, narrowly triangular; elytra not connate; ventral flange subapical. Metanotum micropterous, wings scale-like, $<0.5\times$ length of metanotum; axillary sclerites obsolescent. Legs retractile into sternal fossae; procoxa globular; mesocoxa conical,

slightly transverse; metacoxa transverse to metepisternum, narrow laterally; trochanter narrow, elongate triangular; femora wide, compressed fusiform, ventrally flattened to receive tibiae; tibiae dorsally expanded, cariniform, set with comb-like arrangement of short spines; tarsi 5-segmented, segments 1–4 progressively shorter and segment 5 subequal in length to 2–4 together, segments 1 and 2 densely pubescent ventrally, segment 3 with fleshy ventral lobe; pretarsus with a pair of simple claws and 2 empodial setae.

Abdomen with sternites coarsely, moderately-densely punctate; sternite 1 broadly excavated to receive metalegs; sternites 2–4 subequal, sutures shallowly arcuate; sternite 5 broadly rounded to subtruncate apically, 2× length of sternite 4, medio-apically depressed. Male with aedeagus simple, trilobed, ostium ventral and at midlength of median lobe. Female with gonocoxites compressed, broadly arcuate laterally, densely setose; styli short, peglike, apically setose, moderately sclerotized.

Listemus acuminatus (Mannerheim)

Morychus acuminatus Mannerheim 1852: 341.

Lectotype here designated: sex unknown [abdomen missing]. Labelling: “84.; 106; P. acuminatus !Mannerh., Sitkha; Type 2294.” Repository: Museum of Comparative Zoology, Cambridge. Type locality: “insula Sitkha,” Alaska.

Pedilophorus acuminatus (Mannerheim), of LeConte 1857: 30 (not 1854: 115); Hamilton 1894: 27; Wickham 1903: 181; Dalla Torre 1911: 16.

Listemus acuminatus (Mannerheim), of Casey 1912: 12; Leng 1920: 191; Hatch 1961: 296.

Listemus formosus Casey 1912: 12; Leng 1920: 191; Hatch 1961: 296. **NEW SYNONYM.**

Lectotype here designated: male. Labelling: “Cal; Casey bequest 1925; Type USNM 48325; formosus Csy.” Repository: U.S. National Museum of Natural

History. Type locality: Arcata, Humboldt Co., California.

Listemus satelles Casey 1912: 13; Leng 1920: 191. **NEW SYNONYM.**

Holotype: sex not confirmed. Labelling: “Cal; Casey bequest 1925; Type USNM 48326; satelles Csy.” Repository: U.S. National Museum of Natural History. Type locality: Hoopa Valley, Humboldt Co., California.

Mannerheim’s type cannot be located, and may be lost (H. Silfverberg, in litt.) The species was evidently described from at least two specimens collected by Frankenhaeuser and Pippingsköld on “insula Sitkha” (Mannerheim 1852). A specimen bearing Mannerheim’s style of label and handwriting has been examined from the LeConte collection, and may be treated as a cotype as it is known that LeConte had received duplicates from Mannerheim of North American species (Darlington 1961). Based on the indefinite status of Mannerheim’s retained specimen(s) and the label notation “!” indicating that Mannerheim had examined this specimen, the LeConte specimen is here designated the lectotype of *Morychus acuminatus* Mannerheim and has been so identified with my label.

The type specimens of *L. satelles* and *L. formosus* are nearly indistinguishable conspecific forms. Casey (1912) separated these putative species on highly variable sculptural, coloration and pubescence characteristics. Variations in these latter two species and *L. acuminatus* overlap considerably.

Specimens attributable to either *L. acuminatus*, *L. satelles*, or *L. formosus* have been examined from throughout the known range of *Listemus*. Specimens expressing a pattern of relatively denser and coarser punctation and pubescence occur at more coastal sites in California and Oregon, with specimens expressing sparser and finer punctation and pubescence occurring more northward and along the west side of the Cascade Range. In addition, the apices of

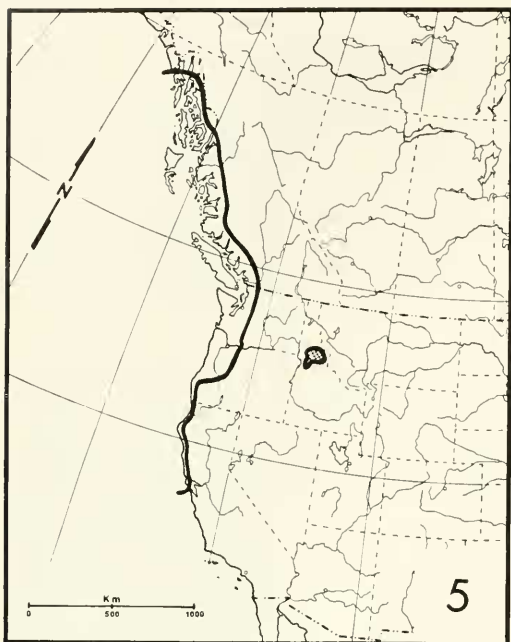


Fig. 5. Generalized distribution of *Lioon* spp. in western United States and Canada. *Lioon simplicipes* is coastal and open; *L. nezperce* is inland and cross-hatched.

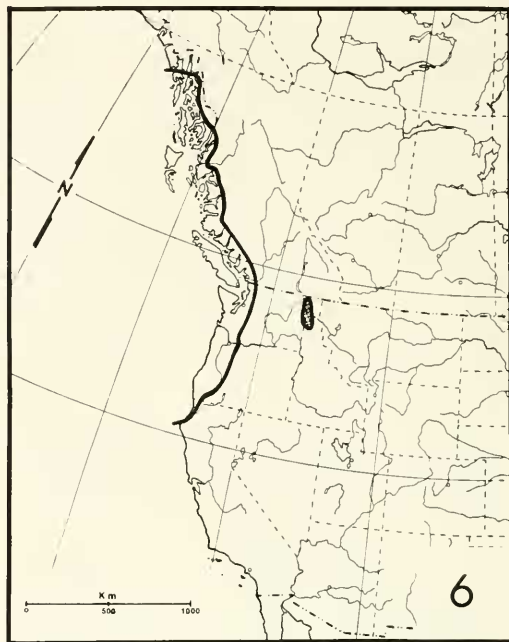


Fig. 6. Generalized distribution of *Listemus* spp. in western United States and Canada. *Listemus acuminatus* is coastal and open; *L. kootenai* is inland and crosshatched.

the parameres are slightly more elongate in males from northern British Columbia and adjacent Alaska. This morphological trend appears to coincide with a trend of coarser rugosity of humeral areas and with the remainder of the elytra being sparsely and finely punctate. In addition, the lateral margins of the parameres vary in depth of mid-length sinuosity, from nearly linear to concave, but no geographically related trends are apparent. A coloration trend is also apparent with more northerly and Cascadian specimens tending to be evenly aeneous and more coastal specimens often possessing distinct viridescent vittae.

There are no marked or regular separations of any variations to warrant taxonomic separation, and in fact large population samples will frequently contain most possible variations. Interestingly, neither the types nor other specimens in the Casey collection show any indication that he was aware of this degree of variation.

Listemus kootenai, NEW SPECIES

Characters of the genus, except: length 4.0–4.4 mm, width 2.3–2.5 mm; pronotal and head punctures large, coarse; elytral punctuation coarse, evenly distributed, not condensed to form rugose patches and smooth, impunctate areas, piceous with even aeneous reflections, without alternating evanescent rufous and viridescent vittae; pubescence silvery-grey throughout, not forming patches or vittae. Aedeagus with median lobe apex evenly rounded; lateral lobes slender, apices distinct and attenuate (Fig. 5).

This species is known only from northern Idaho State, Kootenai and Boundary counties, and extreme northeastern Washington State, Pend Oreille and Spokane counties.

The species epithet is a regional place-name treated as a noun in apposition, and refers to the Kootenai Native American tribe which once inhabited the general region involving northern Idaho, northeastern

Washington, northwestern Montana, and southeastern British Columbia.

Holotype deposited on permanent loan to the California Academy of Sciences, San Francisco, through the University of Idaho, Moscow, and with the labelling: IDAHO, Kootenai County, Farragut State Park, 7 May 1985, C. L. Campbell; Holotype *Listemus kootenai* Johnson 1990. Three paratypes with same labelling as holotype, and an additional 7 paratypes with the following locality labellings: IDAHO, Kootenai County, 4 mi. W Athol, 9.VI.1971, W. F. Barr (1); Hannah Cedar Flat, 5.8 mi. S Nordman, 7.VI.1986, P. J. Johnson (1); WASHINGTON, Pend Oreille County, 1 km N Sullivan Lake, 17.VI.1981, R. E. Nelson (2); Spokane County, Mt. Spokane State Park, near Bald Knob campground, 5200 ft., 10.VI.1986, W. J. Turner (2), Bald Knob, 5500 ft., 3.VI.1986, J. B. Johnson (1). Paratypes are located in the collections of the University of Idaho, Washington State University, R. E. Nelson, and my personal collection.

KEY TO *LISTEMUS* SPECIES

1. Dorsal punctation fine to moderate, frequently condensed into rugulose patches on elytra; coloration bright aeneous, usually with distinct viridescent vittae on elytra; aedeagus as in Fig. 3; distribution as in Fig. 6 *L. acuminatus*
- Dorsal punctation coarse, evenly distributed; coloration evanescent aeneous, without viridescent vittae; aedeagus as in Fig. 4; known only from northern Idaho and adjacent Washington *L. kootenai*

Listemus kootenai differs from *L. acuminatus* by the coarser punctation of the pronotum and elytra, the lack of aeneous and viridescent vittae, and shape of the paramere apices (Figs. 5, 6). The allopatric distribution will separate these species as well. *Listemus kootenai* is known only from mesic conifer forests in extreme northeastern Washington State and northern Idaho State. Contrarily, *Listemus acuminatus* is found in mesic conifer forests from northwestern California, through Oregon, Washington,

British Columbia, to southeastern Alaska, eastward only to the western slopes of the Cascade Range.

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